

Evaluating a Digital Resident Diagnosis Log: Reasons for Limited Acceptance of a PDA Solution

Chiang Jao, Ph.D., Daniel B. Hier, M.D., Jian Su, M.S.

Department of Neurology and Rehabilitation
University of Illinois at Chicago, Chicago, IL

ABSTRACT

Personal digital assistants (PDAs) offer opportunities to speed the process of data collection and analysis. We developed a PDA-based program, the *Resident Diagnosis Assistant*, which allows neurology residents to collect key diagnostic information about patients seen and treated and the upload this data into a departmental computer. Physicians often use the expenditure of their time to decide whether to accept a new device.

INTRODUCTION

Neurology residents, like residents in many other training programs, are required to maintain logs of patients that they have seen and evaluated. Physicians and residents are adapting personal digital assistants (PDAs) for these tasks. PDAs offer an opportunity to automate data collection and then upload this data into departmental databases for analysis and reporting purposes. In the past, resident logs were based paper-based methods. Recording of the data was easy, but tabulation, statistical analysis, and reporting were time consuming. Our objectives for the PDA system were to: (1) simplify the sequence of data collection, (2) ease the task of data analysis and reporting, and (3) promote informatics training as part of the neurology residency. We developed a PDA-based program, the *Resident Diagnosis Assistant*, which allows neurology residents to collect key diagnostic information about patients seen and treated and then upload this data into a departmental computer.

METHODS

Neurology residents (N=10) were distributed a Palm m105 PDA at the beginning of training. The *Resident Diagnosis Assistant* is a stand-alone Palm-OS handheld program developed using Pendragon Forms 3.2 (Pendragon Software Corporation, Libertyville, IL). This portable data entry form supports a PDA running Palm-OS 3.0 or later with at least 280K of free memory space. Collected patient data is "hot-synched" to an MS-Access-compliant database in a managed workstation. The *Resident Diagnosis Assistant* data entry form consists of 4 fields including medical record number, the date of examination in a monthly-calendar format, 17 procedure types (for example, consultation, inpatient,

outpatient, deep brain stimulation, sleep study, EEG), and 94 diagnosis types (for example, ataxia, dementia, epilepsy, head injury, stroke, vertigo) divided into 11 alphabetic-ordered categories. Both procedure and diagnosis types are in the check-box format to avoid potential typing errors and permit discrete item data entry. Patient name is not recorded to preserve patient confidentiality.

LESSONS LEARNED

A user survey evaluated the program's usefulness and interface. Preliminary results showed low user acceptance of this new technology (60%). Low-end PDAs exhibited slow performance in enumerating diagnosis types; high-end PDAs performed better. Pendragon Forms supports a bi-directional data transmission feature to upload patient demographics information into PDAs. With this feature, waiving the need to enter patient medical record number could speed data entry. However, this feature requires either interfacing the PDA to the hospital's electronic medical record or interfacing the PDA with a bar code reader to allow the resident to easily enter patient demographic information. Users also complained about the complexity of the user interface and the long time needed to enter a single patient entry.

CONCLUSION

PDAs offer opportunities to speed the process of data collection and analysis. Neurology residents are required to maintain logs of patients seen. However, initial acceptance of a PDA-based data collection tool was poor. Reasons for limited acceptance included slowness of the devices, a cumbersome user interface, and the need to enter patient data manually. PDA performance issues, user interface issues, and data entry issues must be effectively addressed to get physicians to use these devices for data collection. Physicians will often use the expenditure of their time to decide whether to accept a new device. In order to get residents to move to PDA-based logs for patient encounters, we will need to make these devices more time efficient for the residents.